

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference PHFR040013WO	<b>FOR FURTHER ACTION</b>	See item 4 below
International application No. PCT/IB2005/000088	International filing date ( <i>day/month/year</i> ) 14 January 2005 (14.01.2005)	Priority date ( <i>day/month/year</i> ) 21 January 2004 (21.01.2004)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant KONINKLIJKE PHILIPS ELECTRONICS N.V.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).
2. This REPORT consists of a total of 8 sheets, including this cover sheet.  
  
In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input type="checkbox"/>            | Box No. II   | Priority  |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention  |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 338 82 70	Date of issuance of this report 24 July 2006 (24.07.2006)  Authorized officer  <div style="text-align: center; font-weight: bold; font-size: 1.2em;">Cecile Chatel</div>  e-mail: pt13@wipo.int
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# PATENT COOPERATION TREATY

REC'D 07 MAR 2005

WIPO

PCT

From the  
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/B2005/000088

International filing date (day/month/year)  
14.01.2005

Priority date (day/month/year)  
21.01.2004

International Patent Classification (IPC) or both national classification and IPC  
H04N7/26, H04N7/50, H04N7/46

Applicant  
KONINKLIJKE PHILIPS ELECTRONICS N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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Lombardi, G

Telephone No. +31 70 340-4329



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/IB2005/000088

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/IB2005/000088

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	1-5
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-5
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: JAIN A ET AL: "SCALABLE COMPRESSION FOR IMAGE BROWSING" IEEE TRANSACTIONS ON CONSUMER ELECTRONICS, IEEE INC. NEW YORK, US, vol. 40, no. 3, 1 August 1994 (1994-08-01), pages 394-403, XP000471199 ISSN: 0098-3063;
- D2: WO 03/036981 A (KONINKLIJKE PHILIPS ELECTRONICS N.V; BRULS, WILHELMUS, H., A; KLEIN GU) 1 May 2003 (2003-05-01).

1. The present application does not satisfy the criteria set forth in Article 33 PCT because the subject matter of the claims does not involve an inventive step (Article 33(3) PCT; Rule 65(1) and (2) PCT).
- 1.1 The subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses in Figure 6 and at pages 398-399, paragraph 2.3 (the references in parentheses applying to this document) a method of coding video data available in the form of a first input stream of video frames, said method comprising the steps of:

- encoding said first input stream to produce a first coded base layer stream suitable for a transmission at a first layer bit rate (step "Baseline compression", where a down sampled version  $I_0$ , having the lowest spatial resolution, of original image  $I_{N-1}$  is compressed);
- based on said first input stream and a locally decoded version of said first coded base layer stream, generating a first set of residual frames (steps "Reconstruction"; up sampling from reconstructed image  $R_0$  to an image  $U_0$  with higher spatial resolution and subtraction of this image from a down sampled version  $I_1$ , having intermediate spatial resolution between the lowest one and

the original one);

- repeating at least once a process of the same type, i.e. generating a second input stream by difference between said first input stream and said locally decoded version of the first coded layer stream, and applying to said second input stream the previous two steps in order to produce:
  - based on said second input stream, a second coded layer stream, suitable for a transmission at a second layer bit rate (parallel steps as the ones cited before at Level #1);
- any further repetition of said process comprising operations as provided in previous step but with progressively increased indices in order to produce third coded layer streams (parallel steps as the ones cited before at Levels #2 up to Level #N-1, corresponding to the highest spatial resolution and the original image);

said first input stream being thus, for obtaining a predetermined required spatial resolution, compressed by:

- encoding the layers up to said required spatial resolution with a lower bit rate (page 402, paragraph 3.2: fewer DCT coefficients are used in layers with lower spatial resolution); and
- allocating a higher bit rate to the last layer which corresponds to said required spatial resolution (page 402, paragraph 3.2: all DCT coefficients are used in the layers with highest, i.e. required, spatial resolution).

The subject-matter of claim 1 therefore differs from this known method in the following features:

- after the generation of the first set of residual frames, based on said first input stream and a locally decoded version of said first coded layer stream, which is then a first coded base layer stream, encoding residual frames as first enhancement layer stream to produce a first coded enhancement layer stream;
- in any further repetition of said process comprising operations as provided in the step of generating a coded base layer stream, repeating also the previous step in order to produce further coded enhancement layer streams.

1.2 The problem to be solved by the present invention may therefore be regarded as



improving output video quality at every layer having regard to the bandwidth constraints (filed description, page 2, lines 4-18).

This problem is disclosed by document D1, page 402, paragraph 3.2, and is therefore not new in the sense of Article 33(2) PCT with Rule 64(1) to (3) PCT.

- 1.3 The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

Document D1 (page 402, paragraph 3.2) discloses, as solution to the problem posed, that the images at every resolution level, with reference to the method disclosed in Figure 6, should be reconstructed using all the DCT coefficients (quantized at high quality factors) in order to guarantee good subjective visual quality at all spatial levels.

However, document D1 discloses also the disadvantage that this would require coarser quantization of the difference images at higher spatial levels, in order to comply with the bandwidth constraints, so that the problem posed is apparently not completely solved (coarse quantization at highest levels may obvious worsen the subjective quality thereof).

Furthermore, document D1 (page 402, paragraph 3.2) discloses explicitly also the concept that the number of DCT coefficients used to reconstruct the difference image can be varied.

Varying the number of DCT coefficients in encoding an image is disclosed in document D1 (pages 397-398, paragraph 2.2; pages 400-401, paragraph 3.1) as a method for SNR scalability.

Therefore, by both suggestions given by said disadvantage and said concept, the person skilled in the art would be prompted to combine the spatial scalability method disclosed in Figure 6 with the SNR scalability method disclosed by paragraphs 2.2 and 3.1 of document D1, mentioned above, thus straightforwardly deriving the features which make the difference between the subject-matter of claim 1 and the known method, in order to solve the problem posed.

In conclusion, claim 1 does not involve an inventive step.

- 1.4 The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 3,4, which therefore are also considered not inventive.
2. Dependent claims 2,5 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, see document D2 and the corresponding passages cited in the search report.

In particular, the features of claim 5 are standard design features.



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REC'D 07 MAR 2005

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(day/month/year) see form PCT/ISA/210 (second sheet)

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PCT/B2005/000088

International filing date (day/month/year)  
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Priority date (day/month/year)  
21.01.2004

International Patent Classification (IPC) or both national classification and IPC  
H04N7/26, H04N7/50, H04N7/46

Applicant  
KONINKLIJKE PHILIPS ELECTRONICS N.V.

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- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
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- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
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For further options, see Form PCT/ISA/220.

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/IB2005/000088

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**Box No. 1 Basis of the opinion**

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2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
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International application No.  
PCT/IB2005/000088

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	1-5
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-5
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**Re Item V**

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1. The present application does not satisfy the criteria set forth in Article 33 PCT because the subject matter of the claims does not involve an inventive step (Article 33(3) PCT; Rule 65(1) and (2) PCT).
- 1.1 The subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses in Figure 6 and at pages 398-399, paragraph 2.3 (the references in parentheses applying to this document) a method of coding video data available in the form of a first input stream of video frames, said method comprising the steps of:

- encoding said first input stream to produce a first coded base layer stream suitable for a transmission at a first layer bit rate (step "Baseline compression", where a down sampled version  $I_0$ , having the lowest spatial resolution, of original image  $I_{N-1}$  is compressed);
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- repeating at least once a process of the same type, i.e. generating a second input stream by difference between said first input stream and said locally decoded version of the first coded layer stream, and applying to said second input stream the previous two steps in order to produce:
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The subject-matter of claim 1 therefore differs from this known method in the following features:

- after the generation of the first set of residual frames, based on said first input stream and a locally decoded version of said first coded layer stream, which is then a first coded base layer stream, encoding residual frames as first enhancement layer stream to produce a first coded enhancement layer stream;
- in any further repetition of said process comprising operations as provided in the step of generating a coded base layer stream, repeating also the previous step in order to produce further coded enhancement layer streams.

1.2 The problem to be solved by the present invention may therefore be regarded as

improving output video quality at every layer having regard to the bandwidth constraints (filed description, page 2, lines 4-18).

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

**PCT/IB2005/000088**

In conclusion, claim 1 does not involve an inventive step.

- 1.4 The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 3,4, which therefore are also considered not inventive.
2. Dependent claims 2,5 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, see document D2 and the corresponding passages cited in the search report.

In particular, the features of claim 5 are standard design features.